Stated Meeting, March 5.

Present, twenty-three members.

Dr. BACHE, Vice-President, in the Chair.

Letters were received and read:—

From Mr. John P. Brown, dated Constantinople, August 20th, 1846, announcing a donation to the Library:—

From A. D. Bache, Superintendent U. S. Coast Survey, dated Washington, 26th Jan., 1847, announcing a donation:—

From the New Jersey Historical Society, dated Newark, 22d February, 1847, acknowledging the receipt of the Transactions and Proceedings of this Society: and,—

From the Proprietors of the Bowditch Library, dated 28th February, 1847, acknowledging the receipt of the Proceedings of this Society.

The following donations were announced:—

FOR THE LIBRARY.

Mémoires présentés à l'Académie Impériale des Sciences de Saint-Pétersbourg, par divers savans, et lus dans les Assemblées. Tome V. 6 Livraisons. Tome VI. 1re Livraison. Saint-Pétersbourg, 1846. 4to.—*From the Imperial Academy of Sciences.*

Mémoires de l'Académie Impériale des Sciences de Saint-Pétersbourg. VIme Série. Sciences Mathématiques, Physiques et Naturelles. Tome VII. Seconde Partie. Sciences Naturelles. Tome V. 3me et 4me Livraisons. Saint Pétersbourg, 1846. 4to.—*From the same.*

Mémoires de l'Académie Impériale des Sciences de Saint-Pétersbourg. VIme Série. Sciences Mathématiques, Physiques et Naturelles. Tome VIme. Première Partie. Sciences Mathématiques et Physiques. Tome IVme. 2me Livraison. Saint-Pétersbourg, 1845. 4to.—*From the same.*

Transactions of the Geological Society of London. Second Series. Vol. VII. Part 3. London, 1846. 4to.—*From the Geological Society.*

Monthly Notices of the Royal Astronomical Society of London. Vol. VII. November 13th, 1846. No. 9. 8vo.—*From the Society.*

The Journal of the Royal Geographical Society of London. Volume the Sixteenth. Part II. 1846. 8vo.—*From the Society.*

Grammaire Raisonnée de la Langue Ottomane, suivie d'un Appendice contenant l'Analyse d'un morceau de composition Ottomane, où sont démontrées les différentes Règles auxquelles les Mots sont assujettis. Par James W. Redhouse. Paris, 1846. 8vo.—*From Col. Williams.*

New Haven Harbour, founded upon a Trigonometrical Survey under the direction of F. R. Hassler. Published in 1846. A. D. Bache, Superintendent.—*From Prof. Bache, by direction of the Treasury Department.*

Little Egg Harbour, founded upon a Trigonometrical Survey under the direction of F. R. Hassler. Published in 1846. A. D. Bache, Superintendent.—*From the same.*

An Address delivered at the close of the Sixteenth Exhibition of American Manufactures, held in Philadelphia, by the Franklin Institute of the State of Pennsylvania for the Promotion of the Mechanic Arts, October 30th, 1846. By Solomon W. Roberts, Civil Engineer. Philadelphia, 1846. 8vo.—*From the Author.*

Annual Report of the Trustees of the State Library, made to the Legislature, January 16th, 1847. Albany, 1847. 8vo.—*From the Trustees of the New York State Library.*

Report of the Organization Committee of the Smithsonian Institution: With the Resolutions accompanying the same, and adopted by the Board of Regents: Also, the Will of the Testator, the Act accepting the Bequest, and the Act organizing the Institution. Washington, 1847. 8vo.—*From the Hon. George M. Dallas.*

The Nineteenth Annual Report of the House of Refuge of Philadelphia. With an Appendix. Philadelphia, 1847. 8vo.—*From the Managers.*

The Annual Report of the Board of Directors of the Pennsylvania Institution for the Deaf and Dumb, for 1846. Philadelphia, 1847. 8vo.—*From the Directors.*

The Medical News and Library. Vol. V. March, 1847. No. 51. 8vo.—*From Messrs. Lea & Blanchard.*

Notice sur la Succession des Poissons Fossiles dans la Série des Formations Géologiques. Introduction à une Monographie des Poissons Fossiles du vieux Grès rouge. Tableau Synoptique des Poissons Fossiles du Système dévonien. Essai sur la Classification des Poissons. Par Louis Agassiz.—*From the Right Rev. Bishop Potter.*

ADDITIONS TO THE LIBRARY BY PURCHASE.

Scientific Memoirs, selected from the Transactions of Foreign Academies of Science, Learned Societies, &c. Edited by Richard Taylor, F.L.S. &c. Vol. IV. Part XVI. December, 1846. 8vo.

The Edinburgh New Philosophical Journal. Conducted by Professor Jameson. Vol. XLII. No. 83. January, 1847. 8vo.

The London, Edinburgh, and Dublin Philosophical Magazine, and Journal of Science. Third Series. No. 198. January, 1847. 8vo.

Astronomische Nachrichten. Nos. 579, 584, and 585. 4to.

Prof. Tucker read an "Essay upon Cause and Effect, being an Examination of Mr. Hume's Doctrine that we can perceive no necessary connexion between them," which was referred to a Committee, consisting of Right Rev. Bishop Potter, Dr. Demmè and Dr. Bethune.

Dr. Patterson again called the attention of the Society to the circumstance mentioned at the last meeting, viz. that Mr. Sears C. Walker had, on the 2d of February, detected a missing star in the Histoire Céleste Française, observed by Lalande on the 10th of May, 1795, which was near the path of Leverrier at that date, and which may possibly have been that planet.

Shortly after the arrival of the news of the physical discovery of the planet, on a suggestion by Mr. Herrick, of its possible identity with the Wartman planet of 1831, Mr. Walker engaged in the study of the orbit of the former, and soon concluded that it could not have been Leverrier, nor could any set of elements, with a mean distance at all probable, be found, that would represent the four places of Wartman's planet, as published in the Comptes Rendus for 1836.

In his first inquiry, he learned the probable near approach of the orbit of Leverrier to the circular form. The analogy of the remote planets with great masses led to the same conclusion.

Jupiter's eccentricity is		0.048
Saturn's	"	0.056
Herschell's	"	0.047
Leverrier's	"	$<$0.060 conjectured.

If such were the character of the orbit, the radius vector, at so great a distance, would vary but little with the time, and in a first approximation might be wholly neglected. From the planets' places

Sept. 26, Oct. 26, and Nov. 1, on the supposition of a constant radius vector, he computed the following table of the average true siderial daily motion n', n & $n_{,}$ for the first, whole and last interval respectively, for various radius vectors. Also the mean daily siderial motion μ for $r = a$, or radius vector equal the mean distance.

r	n'	n	$n_{,}$	μ
	″	″	″	″
34	12.8	16.7	19.7	17.90
33	14.6	17.7	20.3	18.71
32	16.6	18.8	20.8	19.60
31	19.4	20.1	21.2	20.56
30	21.7	21.6	21.6	21.58
29	24.1	23.4	22.0	22.67

The most plausible value of r in this table is that in which $(n - n')^2 + (n - n_{,})^2$ is a minimum. This gives nearly $r = 30$, $n' = n = n_{,} = \mu$. Hence the orbit comes out nearly a circle, unless we suppose the planet to present, at this time, a value of r *accidentally* equal to a, in a more eccentric ellipse with true anomaly nearly 90°.

Accordingly, he selected for the next trial the circular hypothesis, for which two places of the planet, Sept. 26th and Dec. 26th, sufficed. The first was derived from the mean of nine European observations. The last from his own observations with the Washington equatorial, consisting of thirty-three comparisons in R. A. and eleven in Dec., with the two stars first selected for comparison by Encke. In the computations all the small corrections were taken into account. The geocentric longitude α and latitude δ, were referred to the mean equinox and obliquity of Jan. 1st, 1847. The planet's place was corrected for aberration as a fixed star, for planetary parallax, but not at first (though subsequently so) corrected for planetary aberration. In this manner, he obtained Elements I. and computed an ephemeris for the six months following August 1st. He then reduced the entire collection of European observations received, seventy nights' works in all, and the forty-six nights' works of American observations at the Washington Observatory, and compared them with the ephemeris. The sixteen normal places indicated the following comparison between theory and observation. The dates are referred to mean time, Greenwich. The places are reduced like those of Sept. 26th and Dec. 26th, but are not corrected for planetary aberration.

Normal Places of Leverrier.

No.	t = 1846 years. d	Obs. Geo. lon. α ° ′ ″	No. of Obs. hh	Obs. Geo. lat. δ ° ′ ″	No. of Obs. hh	Obs.–Eph. Δα ″	Obs.–Eph. Δδ ″
1	215.5670	327 9 49.34	(1)	−0 31 36.24	(1)	−16.75	−0.63
2	223.5441	326 57 9.04	(1)	44.09	(1)	− 7.27	−1.03
3	270.5	325 46 25.82	(16)	57.99	(16)	− 1.02	+0.84
4	276.5	39 54.23	(13)	56.14	(13)	+ 0.27	+1.51
5	282.5	34 16.11	(13)	56.09	(13)	+ 1.12	+0.03
6	290.5	28 21.99	(12)	53.16	(12)	+ 3.13	+0.80
7	298.5	24 25.25	(18)	51.13	(19)	+ 4.19	+0.56
8	306.5	22 32.46	(16)	47.61	(6)	+ 3.02	+0.23
9	313.5	22 40.00	(4)	45.15	(3)	+ 2.40	−0.68
10	319.5	24 6.40	(4)	41.51	(6)	+ 1.95	+0.51
11	325.5	26 50.59?	(4)	37.30?	(4)	+ 3.77?	+2.21?
12	334.5	33 9.44	(7)	33.92	(6)	+ 2.46	−1.13
13	345.5	44 26.93	(4)	30.79	(4)	+ 0.96	−0.03
14	353.5	54 58.01	(2)	27.10	(2)	− 0.72	+1.51
15	359.5	326 4 2.52	(3)	26.04	(3)	− 0.23	+0.77
16	372.5	326 26 39.11	(3)	23.60	(3)	− 4.40	+1.28

The residual errors show, in the course of six months, a sensible deviation of the orbit from the circular form. They also show, that for an eccentricity greater than 0.06, the true anomaly must be nearly $\pm 90°$; a possible, but it may be said an improbable case.

The next step was to make equations of condition of the form $o = a\,x + b\,y + c\,z + n$. In which a, b, c, are computed coefficients; x is $50 \times \Delta r$, y is $10 \times \Delta \nu$, $z = \Delta \lambda_{300}$, ν is the daily increase of the true heliocentric longitude, λ_{300} the longitude on the 300th day of the year. Finally, n is the equivalent heliocentric value of $\Delta\,\alpha$ above, with sign changed. The number of equations was reduced to 9, by taking, first, the third of the mean of 1 and 2; next 3, 4, 5, 6, and 7; then the mean of 8, 9, and 10. No. 11 is rejected; then the mean of 12 and 13, and lastly of 14, 15, and 16. To these nine conditional equations equal weights were assigned as follows:—

						Residual error. ε
0	=	−0.303 × x	−2.700 × y	$+\frac{1}{3} \times z$	+3″.88 ,	−0″.08
	=	+3.016	−3.000	+1	+1.00 ,	+0.49
	=	+3.363	−2.400	+1	−0.27 ,	+0.19
	=	+3.685	−1.800	+1	−1.10 ,	+0.22
	=	+4.038	−1.000	+1	−3.07 ,	−1.03
	=	+4.268	−0.200	+1	−4.12 ,	−1.31
	=	+4.594	+1.267	+1	−2.44 ,	+1.03
	=	+4.248	+3.950	+1	−1.73 ,	−0.13
	=	+3.332	+6.133	+1	+1.81 ,	−0.16

The solution by least squares gives,—

0	=	118.879 × x	+ 7.477 × y	+ 30.443 × z	— 45.629″
0	=	7.477	+ 85.149	+ 0.250	+ 1.687
0	=	30.443	+ 0.250	+ 8.111	— 8.627

$$\text{Whence } \Sigma\,\varepsilon\varepsilon = 4''.21$$
$$x = 3.255712$$
$$y = -0.272963$$
$$z = -11''.1475$$
$$r = 29.939950 + \frac{x}{50} = 30.00506$$
$$n = \frac{v_{359} - v_{270}}{t_{359} - t_{270}} \text{ corrected for ab.} = 21''.65789$$
$$a = \frac{1}{\frac{2}{r} - \left(\frac{r\,n}{\varkappa^2}\right)^2} = 30.20058$$
$$\varkappa = \text{Gauss' constant of earth's velocity.}$$
$$\mu = \varkappa\, a^{-\frac{3}{2}} = 21.37881$$
$$\text{Period} = T = 165.97030 \text{ tropical years.}$$

Thus it appeared that Elements II. assuming the eccentricity and perihelion point unknown, and neglecting the daily variations of the radius vector, would give an ephemeris following the planet's path for a period of 5½ months, with a sum of the squares of nine discrepancies = 4″.21, or a probable error of ± 0″.48 for any comparison.

This residual error might perhaps have been still further reduced by inserting a term of the form $d \times u$, where u is the daily variation of the radius vector, and $d = a\,\Delta\,r + \left(\frac{\Delta\,\lambda}{\Delta\,t}\right)\Delta\,\lambda$, $\frac{\Delta\,\lambda}{\Delta\,t}$ being the time variation of the daily motion in true longitude, on the principle of conservation of areas. Inasmuch as these terms become more sensible in the course of a few additional months, it was thought better to postpone the research after the final values of e and π; and by assigning to them suitable limits of $e < 0.06$, and to π its corresponding value from the equation, $\cos v = \frac{a\,(1-e^2) - r}{e\,r}$, then to compute the locus of Leverrier for any given date, and search for it as a missing star observed that night in some of the ancient catalogues.

The fact of $(n - \mu) = 0''.28$, shows that the limit of v is ± 90°, thus,—

For $e = 1.00$	$v = \pm 90.0^\circ$	
For $e = 0.06$	$v = \pm 87.2$	2.8°
For $e = 0.05$	$v = \pm 85.4$	1.8
For $e = 0.04$	$v = \pm 83.0$	2.4
For $e = 0.03$	$v = \pm 79.2$	3.8
For $e = 0.02$	$v = \pm 72.2$	7.0
For $e = 0.01$	$v = \pm 50.1$	22 1
For $e = 0.006474$	$v = 0.0$	50.1

Hence the à priori probability that e falls below 0.02 is $\frac{72.2}{90}$, and that it falls below 0.01 is $\frac{50.1}{90}$, and this probability is based on a theory that has for its probable discrepancy from observation for $5\frac{1}{2}$ months $\pm 0''.49$.

The next inquiry is, how far this small period and small eccentricity may be reconciled with the conditional equations obtained by Leverrier and Adams, between its perturbations of Herschel and the residual perturbations of that body.

In the supplement to the Nautical Almanac for 1852, Mr. Adams states that a mean distance of about 32, and small eccentricity, agrees with his computation better than the two hypotheses of a mean distance much greater; and that the small mean distance and eccentricity are in accordance with the planet's present place in the heavens.

From the results of Mr. Adams' two hypotheses, Mr. Walker derives the formula,—

$$e = 0.16103 \left[\frac{0.12062}{0.16103}\right]^{\left(\frac{\log.\ \frac{a}{38.4}}{\log.\ \frac{1}{1.03}}\right)}$$

This gives $e = 0.0153883$ for $a = 30.20058$.

It remains to consider M. Leverrier's paper in the Additions to the Connaissance des Temps for 1849.

He there fixes the place of the planet at $240^\circ \pm 5^\circ$ in 1840, for the longitude of the epoch. Mr. Walker's Elements II. would give with eccentricity < 0.06, the epoch $= 226^\circ$ nearly. Hence the limit of M. Leverrier would be required to be doubled to include Mr. Walker's solution.

This limit of M. Leverrier may be readily extended to double his assigned value, if we do not require this one disturbing planet to exhaust the residual perturbations of Uranus, but are willing to leave something to other still superior planets to be discovered hereafter.

It was in the course of an examination of M. Leverrier's paper, by Prof. Peirce, of Harvard University, in company with Mr. Walker, for the purpose of explaining this discrepancy, that the suggestion was made by the former, of the possibility of some neglected inequality of long period being sufficient to account for it. To their great surprise, on comparison it was found that

For Uranus,	$\mu' = 42''.23312$	Astr. Nachr. 580.
Walker's Elements II., Leverrier,	$\mu = 21.37881$	
	$2\mu - \mu' = 0.52450$	

Here, then, if Mr. Walker's period is right, would be the most remarkable inequality in the primary solar system. On a careful examination of Leverrier's paper, it does not appear that he took this into account; but instead of it, that he used that of $(3\mu - \mu')$, suited to the first assumed mean motion for $a = 38.37$. When we consider that this inequality, in its terms depending on the square of the time, amounts to nearly one-twelfth of the entire perturbations of Uranus, by Leverrier, in Flamsteed's time and at present, and that a similar inequality of still greater power, if substituted in its place, might amount to a much larger proportion, it would seem that the question of *à priori* limits from residual perturbations depends much on a circumstance not noticed by M. Leverrier, viz. the possibility of a powerful inequality of the order $(2\mu - \mu')$. If, then, it be probable that Mr. Walker's period is correct, that period, by means of this new inequality, explains its departure from the limits assigned by M. Leverrier.

Since, then, Mr. Walker's Elements II. are not necessarily incompatible with the limits of M. Leverrier and Adams, it was desirable to see whether the indeterminate quantities e and π could be supplied by finding some ancient observation.

For this purpose, on the 2d of February he examined the principal catalogues.

I. Bradley seldom observed stars of 7th and 8th magnitude.

II. Mayer.

III. Lacaille.

IV. Piazzi. There is no star among the list "not found in the Catalogues," from 1792 to 1798, which could be supposed to be Leverrier. The subsequent observations of Piazzi, under progress of publication by the Vienna Observatory, have not yet been received.

V. Lalande, H. C. See subsequent discussion.

VI. Bessel in his zones never observed so low as the actual Leverrier region.

VII. Paramatta Catalogue, seldom observed north of — 33°.

VIII. Madras Catalogue. Mr. Taylor confined himself chiefly to reviews of Baily and Piazzi.

Thus it appears, that though doubtless Leverrier has been seen by some of these authors, still the Histoire Céleste afforded the only chance of easily finding an observation of this planet. For limits of $e < 0.06$, the only nights in which Lalande had Leverrier in his region, were the 8th and 10th of May, 1795. For the latter date, Mr. Walker computed the locus of Leverrier, for various eccentricities, and for $\pm v$, as in the following table, in which Leverrier's R. A. and Dec. are for the mean equinox of 1800, to correspond as a star to Hussey's XIVth Hour.

	e	Leverrier's $\mathcal{A}$. 1800.	Leverrier's D. 1800.
		h. m. s.	° ′
For — v	0.06	13 45 50	— 9 3.1
,, ,,	0.05	13 49 48	— 9 24.9
,, ,,	0.04	13 53 51	— 9 47.0
,, ,,	0.03	13 57 52	— 10 8.6
,, ,,	0.02	14 1 56	— 10 29.6
,, ,,	0.01	14 6 22	— 10 53.5
For $v = 0$	0.006470	14 9 18	— 11 8.8
For + v	0.01	14 12 9	— 11 23.5
,, ,,	0.02	14 16 36	— 11 44.5
,, ,,	0.03	14 20 35	— 12 6.1
,, ,,	0.04	14 24 29	— 12 25.2
,, ,,	0.05	14 28 19	— 12 44.4
,, ,,	0.06	14 32 8	— 13 2.6

Mr. Walker then formed the following catalogue of all the stars in the H. Céleste, May 8th and 10th, 1795, within 15′ north or south of the locus of Leverrier, as follows:

No.	Mag.	R. A. 1800.	Dec. 1800.	Authority.	
		h. m. s.	°		
1	9.10	13 50 36	— 9 24.0	L.	
2	7. 8	13 52 48	— 9 55.8	L.	
3	7. 8	13 52 53	— 9 45.7	L. B.	
4	8. 9	13 57 13	— 10 11.7	L. B.	
5	9	13 59 54	— 10 26.4	L. B.	
6	8	14 0 0	— 11 26.5	L. B.	
7	8	14 12 0	— 11 8.3	L. B.	
8	7. 8	14 12 09	— 11 20.96	L.	missing *
9	8	14 29 37	— 13 10.7	L. B.	

In this list, there are only three stars, viz: Nos. 1, 2 and 8, which have not also been seen by Bessel. No. 1 is too small, 9.10 magnitude. No. 2 was considered too far south (17′) of the computed place of Leverrier. No. 8 was only 2′ north of the computed locus of Leverrier. It was of the right magnitude and not in Bessel. This circumstance was noticed by Mr. Walker on the 2d of February, and notified by letter, dated that evening, to Lieut. Maury, the Superintendent of the Washington Observatory, with a statement of Mr. Walker's belief, that as soon as the weather, then cloudy, should become clear, that star on examining the heavens would be missing.

On the 4th of February, Prof. Hubbard examined the heavens, and found that the star was missing. Here, then, was an argument in favour of the identity of the missing star and the planet Leverrier. The general view of the case was this. Mr. Walker believed the limits were sufficiently extensive to embrace the Leverrier region. It was probable that Lalande had not omitted a star of the 7, 8 magnitude. No other star could be found in the H. Céleste which, if now missing, could be reasonably supposed to have been the planet. The alternative left was to presume, either that Lalande did not observe this planet, or that this missing star was Leverrier.

To offset this probability, however, Mr. Walker's attention has since been called to a circumstance not noticed by him at the time, viz: that the missing star has the mark of a colon (:) after it in the H. Céleste, by which Lalande used to indicate that the declination was doubtful to the extent of ± 5′. As this would leave it within admissible limits, Mr. Walker would still have considered their identity as not being improbable, if the two stars seen nearly at the same time by Lalande, and marked with different declinations and magnitudes, could not be supposed to have been one. In this case, no star would be missing.

The entries in the H. Celeste are thus made:—

No.		Wire I.	Mid Wire. h. m. s.	Wire II. h. m. s.	Zenith Distance. ° ′ ″
1 ,	✻ 7, 8		14 11 23.5		60 7 19:
2 ,	2 Librae 6		14 12 3.4	14 12 31.5	59 33 59
3 ,	✻ 8, 9			14 11 50.5:	59 54 40

There is no principle of construction of these entries, by which No. 1 and 2 are made the same. Yet the three entries with two colons, and the third entry out of order in place, prevent the strong inference that might be drawn from an undoubted observation of No. 1, which is now missing, while No. 2 is now found, and was observed by Bessel.

Viewing all the circumstances of the case, Mr. W. though strongly inclined to the affirmative, would not venture to express a final opinion on the question of identity at this time. For the sake of priority in completing the orbit of Leverrier, if this identity should at any time hereafter be confirmed, he had computed a third set of Elements III., which, with I. and II., are contained in the following table:—

Elements of Leverrier referred to the mean Equinox of Jan. 1, 1847, and date of mean time, Greenwich.	Circular Hypothesis. I.	Elliptic Hypothesis. II.	Hypothesis of identity with missing star. Elliptical Elements. III.
Longitude of perihelion, π	Unknown.	Unknown.	0° 12′ 25″.51
„ ascending node ☊	129° 48′ 23″.16	129° 48′ 23″.16	131° 17′ 35″.80
„ epoch, Jan. 1 '47, ϵ	Unknown.	Unknown.	328° 7′ 56″.64
„ on the orbit, Sept. 28th, 1846, ω	326° 59′ 41″.50	326° 59′ 34″.74	326° 59′ 34″.74
Radius vector, Sept. 28 '46, r	29.93995	30.00506	30.02596
Daily sidereal orbital motion, Sept. 28, 1846, n	21.65857	21.65789	21.64553
Inclination, i	1° 45′ 19″.88	1° 45′ 19″.88	1° 54′ 53″.83
Eccentricity, e	0.	Unknown.	0.0088407
Mean distance, a	29.93995	30.20058	30.25042
Period in tropical years, T	163.3259	165.9703	166.3813
Mean daily sidereal motion, μ	21″.65857	21″.37881	21″.32600

Authority was given to the President to address a memorial, on behalf of the Society, to the Legislature of Pennsylvania, asking permission to rent such parts of the building occupied by the Society as are not required for their use; and the Committee on the Hall were authorized to take such measures as may be necessary for presenting such memorial to the Legislature.

Stated Meeting, March 19.

Present, twenty-one members.

Dr. Patterson, Vice-President, in the Chair.

Letters were announced and read:—

From the Academy of Sciences of Stockholm, dated Stockholm, 10th October, 1846, announcing donations to the Library of the Society: and,—

From Dr. Joseph Emil Nürnberger, dated Landsburg, near Berlin, 10th November, 1846, announcing a donation to the Society.

The following donations were announced:—

FOR THE LIBRARY.

Kongl. Vetenskaps-Akademiens Handlingar, för år 1844. Stockholm, 1846. 8vo.—*From the Royal Academy of Stockholm.*

Årsberättelse om Framstegen i Kemi och Mineralogi afgifven den 31 Mars, 1846; af Jac. Berzelius, K. V. A. Secret. Stockholm, 1846. 8vo.—*From the same.*

Öfversigt af Kongl. Vetenskaps-Akademiens Förhandlingar. Nos. 8, 9, 10. 1845. Nos. 1 to 6, inclusive. 1846. 8vo.—*From the same.*

Proceedings of the Academy of Natural Sciences of Philadelphia. Vol. III. November and December, 1846. No. 6. 8vo.—*From the Academy.*

Populâres Astronomisches Hand-Wörterbuch. Von Dr. Joseph Emil Nürnberger. Erster Band. A-K. Kempten, 1846. 8vo.—*From the Author.*

Mittlere Oerter von 12000 Fix-sternen, für den Anfang von 1836,